



Panel Turn Coordinator User Manual

Installation, Operation & Specifications

Last Revised: 12.15.2025

Part # RTCC-020 (2 1/4" panel cutouts)

Part # RI-2025-15-TCC (3 1/8" panel cutouts)

(Non-TSO / Non-PMA — Experimental Use Only)

IMPORTANT — READ FIRST

This Turn Coordinator is not TSO'd and not PMA'd. It is not approved for certified installations. It is intended for experimental aircraft and other non-certified applications only.

It is provided for advisory / secondary situational awareness only and is not a primary flight instrument. Do not use as the sole reference for IFR flight, night operations, or in any regime prohibited by your national aviation authority or operating limitations. The pilot in command must always cross-check certified instruments and remain responsible for safe operation.

Calibration must be performed only in smooth air. Turbulence, rough taxi surfaces, or maneuvering will corrupt calibration.

1. Product overview

Radiant's Turn Coordinator presents turn (yaw) and coordination (slip/skid) simultaneously on a single, daylight-readable LCD. Yaw is derived from a solid-state gyro; coordination is derived from a solid-state accelerometer.

Sensor system note: The gyro yaw + inclinometer behavior is the same architecture used in Radiant's SafeTurn / SafePanel family—stable, smooth, and designed for real-world vibration environments.

The unit automatically stabilizes after power-up regardless of initial attitude or acceleration, and is designed for fast re-acquisition (the gyro does not lose reference lock on reset).

2. Key features

- Brilliant, daylight-readable color LCD
 - Simultaneous yaw & coordination depiction (graphic + numeric)
 - 8-step built-in dimming (no external dimmer required)
 - Wide input power acceptance: 9 to 16 VDC
 - Gyro Filter levels 0–3 (pilot-selectable) to balance responsiveness vs smoothness
 - Automatic temperature compensation integrated in firmware
 - Available for standard panel cutouts: 2-1/4" and 3-1/8"
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3. Specifications

Form factors:

- 2-1/4" (57 mm class) instrument cutout — Part # RTCC-020
- 3-1/8" (80 mm class) instrument cutout — Part # RI-2025-15-TCC

2-1/4" physical size (typical): body approx. 2.35 in square × 0.75 in deep; weight ~1.6 oz (≈ 50 g).

Input power: 9–16 VDC.

Typical draw: ≤110 mA at full brightness; ~30 mA at minimum brightness (typical).

Operating temperature: 0 to +45 °C (LCD included).

Displayed turn rate ranges (typical):

- Graphical airplane symbol: up to ±5.0 °/s
- Digital numeric yaw: up to ±20.0 °/s

Display luminance: ≥ 450 cd/m² at full brightness; wide viewing angle (to $\sim 80^\circ$).

Environmental note: This instrument has not been qualified to DO-160. Avoid condensation, liquid ingress, or direct spray.

4. In the box

- Radiant Turn Coordinator instrument assembly
 - This manual
 - Panel mounting screws/hardware (as supplied for your cutout size)
 - Power lead or connector (as supplied)
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5. Installation

5.1 Panel Cutout and Mounting

Verify you received the correct mechanical version for your panel cutout size.

2-1/4" cutout (RTCC-020):

- Fits a standard 2.25" round opening with two mounting holes on a 2.625" bolt circle.

3-1/8" cutout (RI-2025-15-TCC):

- Fits a standard 3.125" round opening.

Mounting guidance:

- Mount the instrument upright and square to the panel.
- Ensure the panel area is rigid. A flexing panel will degrade readings.
- Tighten mounting hardware securely, but do not over-torque. Over-torquing may cause screen breakage or distortion.
- Use only the supplied hardware. Do not drill out mounting holes; doing so may damage the enclosure and void the warranty.

5.2 Power & Wiring

Provide switched aircraft power via your avionics master / switched avionics bus (recommended).

- Connect +V to 9–16 VDC ship power and connect GND to airframe ground.

- Recommended wire: 22–24 AWG. Route away from ignition/HT leads and high-noise cables.
- Use a clean ground. Poor grounds can cause resets and unreliable indications.
- Provide circuit protection (fuse or breaker) sized 0.5–1.0 A.

5.3 First Power-Up

- After installation, power the unit and allow it to stabilize.
 - Perform calibration before first flight (see Section 8).
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6. Controls, indicators & screens

LCD main view — three regions:

- Top: digital yaw rate ($^{\circ}/s$)
- Center: airplane symbol indicating turn direction/magnitude
- Bottom: bubble-style roll inclinometer (coordination)

Status indicator (middle-left):

- White: normal operation
- Yellow: yaw slewing faster than the airplane graphic's range
- Red: airplane graphic at end-of-range

Buttons:

- DIM: press and hold the DIM button to step brightness through 8 levels.
 - CAL: press and hold the CAL button for ≥ 7 seconds to calibrate (stores offsets and reboots).
 - Gyro Filter: press BOTH buttons simultaneously to cycle Gyro Filter level 0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 0.
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7. Gyro Filter (Yaw Smoothing)

The Gyro Filter setting allows you to balance responsiveness vs. smoothness of the yaw (rate) indication.

To change filter level: short-press BOTH buttons simultaneously. The filter advances 0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 0.

Filter levels:

- Level 0 — Aerobatic / snappy: minimal smoothing; fastest response; most sensitive to bumps.
- Level 1 — Balanced (default): everyday GA handling.
- Level 2 — Smooth: stronger damping for turbulence or training; slight lag.
- Level 3 — Molasses: maximum smoothing; very stable display; deliberate response.

Tips:

- If the yaw readout jitters in turbulence, step up a level.
 - If response feels sluggish for quick maneuvers, step down a level.
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8. Calibration

Perform calibration in straight-and-level, unaccelerated flight, in smooth air.

Calibration procedure:

1. Fly to smooth air (this matters more than anything).
2. Establish wings-level, steady flight (no banking corrections).
3. Stabilize for a few seconds.
4. Press and hold CAL for ≥ 7 seconds.
5. The unit will reset/reboot and store offsets and the current gyro filter setting.
6. After reboot, verify straight flight shows near-zero turn and the bubble centers in coordinated flight.

When to calibrate:

- After first installation or significant maintenance.
- After any remounting or panel work.
- If the bubble does not center while wings-level.
- If a turn is indicated while straight in calm air.

If calibration is attempted in a turn or during acceleration, results will be inaccurate. Repeat as needed under proper conditions.

9. Normal Operation

- Power the avionics bus; the Turn Coordinator shows the main display.
- Allow up to 30 seconds for stabilization after large temperature or attitude changes.
- Set brightness as needed (8-step dimming).
- Select Gyro Filter level appropriate for conditions (Section 7).
- Cross-check Turn Coordinator indications with certified instruments when applicable.

Note: The digital yaw readout continues beyond the airplane graphic's range. The instrument incorporates automatic temperature compensation; after abrupt temperature changes, the display may take a brief moment to settle as internal sensors reach equilibrium.

10. Troubleshooting

Symptom	Likely cause	Action
Unit won't power on	No power / wiring issue	Verify 9–16 VDC at the instrument, check fuse/breaker, verify ground.
Display flicker or resets	Aircraft power transients / wiring	Improve grounding, check connections, verify circuit protection.
Bubble doesn't center in level flight	Calibration needed	Calibrate in smooth air (Section 8).
"Turning" is shown while straight	Calibration needed / acceleration during calibration	Re-calibrate in smooth air; confirm wings-level and unaccelerated.
Yaw readout jittery in turbulence	Gyro Filter too low	Increase filter level (e.g., 0→1 or 1→2).
Yaw feels sluggish / delayed	Gyro Filter too high	Decrease filter level (e.g., 3→2 or 2→1).
Display slow to settle after power-on	Normal thermal/attitude stabilization	Allow up to 30 seconds to stabilize; re-calibrate if needed.

If symptoms persist after following the above, power-cycle the unit and recalibrate.

11. Maintenance & care

- Keep the display window clean with a soft, non-abrasive cloth. A lens cleaning cloth is ideal.
 - Avoid solvents or high-pressure spray; the unit is not liquid-sealed.
 - Avoid condensation and liquid ingress.
 - Verify mounting screws remain snug (do not overtighten).
 - Periodically check wiring and the inline fuse/breaker.
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12. Safety, limitations & legal notices

- **Non-TSO'd/Non-PMA'd.** Installation and operation are subject to your aircraft's operating limitations and applicable regulations.
 - **Advisory use only.** Not for IFR as sole reference; never a substitute for certified instruments.
 - **Environmental.** Operate within **0 to +45 °C**; avoid condensation and liquid exposure.
 - **Modifications.** Do not enlarge mounting holes or alter the enclosure; doing so may damage the unit and void the warranty.
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13. Warranty & support

Your new Radiant Technology instrument carries a three-year warranty, from the invoice date. Please contact us at support@radiantinstruments.com should your product need warranty service. There is an additional charge for international warranty service.

RETURN / REFUND INFORMATION:

Must be returned in new, uninstalled, resalable condition within 60 days after receipt. Ship to Radiant Technology, PO Box 20690, Wichita KS 67208.

Specifications subject to change without notice.